BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Certificate in Engineering Pearson BTEC International Level 3 Subsidiary Diploma in Engineering Pearson BTEC International Level 3 Foundation Diploma in Engineering Pearson BTEC International Level 3 Diploma in Engineering Pearson BTEC International Level 3 Diploma in Electrical/Electronic Engineering Pearson BTEC International Level 3 Diploma in Mechanical Engineering Pearson BTEC International Level 3 Diploma in Digital Engineering Pearson BTEC International Level 3 Diploma in Manufacturing Engineering Pearson BTEC International Level 3 Diploma in Aeronautical Engineering Pearson BTEC International Level 3 Extended Diploma in Engineering Pearson BTEC International Level 3 Extended Diploma in Electrical/Electronic Engineering Pearson BTEC International Level 3 Extended Diploma in Mechanical Engineering Pearson BTEC International Level 3 Extended Diploma in Digital Engineering Pearson BTEC International Level 3 Extended Diploma in Manufacturing Engineering Pearson BTEC International Level 3 Extended Diploma in Aeronautical Engineering
Unit number and title	**Unit 56: Industrial Robotics**
Learning aim(s)	B Investigate the operation and design of industrial robots for different applications. C Investigate the operation of industrial robot sensors and end effectors
Assignment title	2 Industrial robot design, sensors and end effectors
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	Your manager has been pleased with the way that you have safely carried out maintenance tasks on industrial robots as part of your engineering traineeship. Your next task is to investigate the range of industrial robots used by the company, their applications, drive and control mechanisms.

Task 1	***[Delete all italic red text before issuing to learners. The same robots should be investigated for parts (a), (b), (c) and (d) below.]*** **To do this:** Your tutor will provide you with a suitable given industrial robots or robotic work cell to investigate. You need to research: • the operation and design of the robots that have different applications, and • the operation of the sensors and end effectors used by the robots. **You then need to:** Produce an **evaluation** of the benefits and limitations of the operation and design of robots used for different applications and the operation of the sensors and end effectors used by the same industrial robots. You should also make suggestions for further improvements of these robots and provide reasons for the use of alternatives. Your report should include the: a) Principles of operation for each robot by considering the: • Operational characteristics • Specifications • Types of controller, manipulator, end-effector/tooling • Workspace organisation • Applications and their impact b) Design principles of each robot by considering the: • Types of robotic system • Reference frames • Wrist articulation • Drive mechanisms including electrical, mechanical, pneumatic, and hydraulic c) Control systems of each robot by considering the: • Closed loop servo control systems • Input, output and feedback signals d) Sensors and end-effectors used in each robot by considering the: • Sensor types (at least three) • Sensor applications • Grippers and tools • Tool calibration for different applications
Checklist of evidence	A referenced report that provides an evaluation of

required	the industrial robots, including; • Principles of operation and their applications • Design Principles • Control systems • Sensors • End effectors • Suggestions of improvements (including reasoning) that could be made.
Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria you must show that you are able to:
BC.D2	Evaluate at least two different industrial robots in terms of their design, operation and control, including the use of robotic sensors and end effectors for different applications.
B.M2	Compare the design, operation and control of at least two different industrial robots, including drive systems.
C.M3	Assess the use of robotic sensors and end effectors for different applications.
B.P3	Explain the operating and design principles of at least two different applications for industrial robots.
B.P4	Describe the control systems, including input, output and feedback signals used in at least two different applications for industrial robots.
C.P5	Explain the operating principles of three different types of robotic sensors for different applications
C.P6	Explain the operating principles of two different types of robotic end effectors for different applications
Sources of information to support you with this Assignment	Robotiq, S Bouchard, Industrial robots: What are the different types? 2014 https://blog.robotiq.com/bid/63528/What-are-the-different-types-of-industrial-robots A simple to follow guide to different types of industrial robots and applications http://learnchannel-tv.com/robot/ A bank of resources, from defining industrial robotic systems through safety, co-ordinate systems, grippers, programming and more.
Other assessment materials attached to this Assignment Brief	Robot/installation specifications Access to sensor data Access to end effector data